

REMARKS

Applicants gratefully acknowledge that 1) the application for continued examination was accepted and 2) the Examiner has found patentable subject matter in claim 13, which would be allowed if rewritten to include the subject matter of all the claims from which it depends.

The foregoing amendments in claims 14, 15, 18 and 26 delete the phrase "at the same time" to moot the rejection of claims under 35 USC 112, second paragraph.

The present invention relates to image processing devices and methods, and in particular to apparatus and methods to deal with display devices, as for electronic publishing, that have biased (nonlinear) gradation characteristics, which causes the displayed images to be uneven and therefore more difficult to see. For liquid crystal displays, as explained on page 14, lines 17-20, "white small regions are likely to collapse in general; and where the image is displayed, the small characters fade in many cases."

The art rejections in the pending Action hinge on the disclosure of Shiraiwa U.S. Patent No. 6,201,893. As is discussed in detail below, Shiraiwa does not disclose, or even suggest, the invention as claimed. It does not use the display bias gradation characteristics as an input to any processing of the luminance values input to the system.

Applicants respectfully traverse the rejection of claims 16 and 27 under 35 USC 102(b) as anticipated by Shiraiwa U.S. Patent No. 6,201,893. Applicants also respectfully traverse the rejection under 35 USC 103(a) of all but claim 13 as obvious in view of Shiraiwa when combined with various other references, namely:

Hayashi (claims 1 and 9), Hayashi and Tokuyama (claims 2, 6, 8, 10, 19, 23, 25, and 29); Hayashi and Kuo (claims 11 and 12); Hayashi, Tokuyama, and Takagi (claims 3 and 20); Hayashi, Tokuyama and Pollard (claims 4, 5, 21, and 22); Kuo (claims 17 and 28); and Tokuyama and Yamazaki (claim 24).

Shiraiwa teaches a color television imaging system. The present invention relates to image processing in connection with scanning and displaying for electronic publishing where the display device has biased gradation characteristics. The main thrust of Shiraiwa is to have known image values, such as whiteness balance and a

stable luminance range. The main technique of Shiraiwa is to use plural input ("pickup") images to develop correction parameters for the processed image data to achieve this whiteness balance and stable range..

More specifically, the Examiner cites col. 3, line 54 and display device 40 shown in Fig. 1 of Shiraiwa as teaching applicants' claimed "display device with predetermined gradation characteristics." He argues that while the reference does not expressly mention "gradation characteristics" in connection with the display, it is well known that a display device has gradation characteristics. However, the present invention deals with how these gradation characteristics are used to overcome the problems of bias.

In the present invention, the gradation characteristics of the display device, as estimated, are an input to the luminance correction. In Shiraiwa, Fig. 1, image data flows from the image pickup unit 10 to the display unit 40. No reverse feedback, whether an actual data flow or some estimation of the display gradation characteristic from the display unit to the processing unit 30, is shown or suggested. Moreover, the stated purpose of the Shiraiwa invention is to control "aging of the image pickup element and color filters or a change in illumination light source." (Col. 1, lines 18-20, emphasis supplied.) In other words, the point of Shiraiwa is to compensate for variations at the image input, not to control gradient bias for characteristics of the output display.

This difference is reflected in the emphasis in Shiraiwa on uniformity in white balance, luminance level, and color tone and the use of plural pickup images (see Col. 2, lines 55-59) as input to the generation of parameters to product the adjustments in the image data transmitted to the display.

Because stability and faithfulness of the reproduction image to the pickup image are important in Shiraiwa, the luminance histogram that the Examiner points to as a "contrast elimination" input to the parameter determination is the luminance from the image pickup (Col. 6, lines 55-56). Further, the use of the Shiraiwa histogram is for a "luminance distribution smoothing process" (Col. 6, lines 56-59.) In other words, if, as the Examiner proposes, the luminance histogram of Shiraiwa is equivalent to the "contrast component" of the present invention, the Shiraiwa contrast is used to smooth contrast values from plural input images, not to correct luminance in the display in a

manner that corrects for a bias in gradation characteristics or the output display. Or as stated at Col. 7, lines 19-26:

However, when a luminance histogram is calculated for a plurality of image pickup data, and the luminance-distribution-smoothing processing is performed based on the luminance histogram to determine the image reproduction parameters, for the purpose of performing image reproduction processing, images can be compared based on luminance even it is used [sic] processed reproduced image data.

Further, Applicants do not find in Shiraiwa a “correction of luminance” of each of the plurality of pixels constituting the image,” as claimed. In particular, Applicants do not find a teaching or suggestion in Shiraiwa that the operation of any of its parameters varies with the nature of the display in a given region, as defined in pending claim 2, and others.

Further, Shiraiwa at Col. 8, line 16-20, states that the “gist” of its invention is to “determine the image reproduction parameters used upon conversion of image pickup data into an image signal on the basis of a plurality of image pickup data.” (Emphasis supplied.) The present invention does not look to plural input images to generate the claimed correction.

In sum, Shiraiwa discloses a different solution to a different problem. It neither teaches nor suggests, among other features, the use of gradation characteristics of an output display device or input parameters to correct luminance values.

While the secondary and tertiary references combined with Shiraiwa teach various sharpening, extracting and other techniques, they do not supply the fundamental deficiencies of Shiraiwa noted above.

In view of the above amendment, applicant urges that the pending application is clearly in condition for allowance, and requests same.

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Respectfully submitted,

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